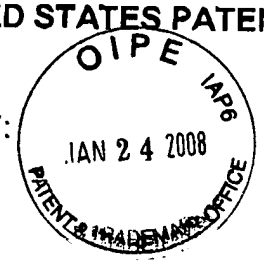
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE



IN THE APPLICATION OF:

ROGER MOONS

CASE NO.: AD6883USNA

APPLICATION NO.: 10/627902

GROUP ART UNIT: 1794

FILED: JULY 25, 2003

EXAMINER: DREW E. BECKER

FOR: IMPROVED THERMOPLASTIC POLYMERIC OVENWARE

DECLARATION UNDER 37 CFR 1.132 OF JOEL CITRON

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

1. I obtained a B.S. in Chemistry from the Polytechnic Institute of Brooklyn in 1962 and a Ph.D. in Organic Chemistry from the University of California at Davis in 1967.

2. I am currently receiving a pension from the assignee of this application E.I. DuPont de Nemours & Co., Inc. (hereinafter DuPont).

3. I am a Registered Patent Agent (No. 33,852).

4. I am currently a consultant for DuPont on technical and patent matters.

5. I am familiar with U.S. Application No. 10/627,902. I am also familiar with the references cited against this application, WO01/34702A2 (herein WO) and U.S. Patent 5,028,461 (Nakamichi), and the Examiner's reasons for citing them.

5. While consulting for DuPont I directed an experiment as set forth below.

6. A composition containing 55 weight percent of Zenite® 6000 Liquid Crystalline Polymer (available from E. I. DuPont de Nemours & Co., Inc., Wilmington, DE 19998 USA), 37 weight percent talc, and 8 weight percent carbon fiber was prepared by melt mixing in a 30 mm Werner & Pfleiderer twin screw extruder. The techniques used to prepare this composition were similar to those commonly used to prepare other compositions containing LCPs.

7. The above composition was molded in a 6 oz. HPM injection molding machine into 4 inch diameter disks.

8. An above described disk (after machining) was tested for through plane thermal conductivity. The resulting value was 0.368 W/m°K.

9. The attached pages from Electronic Research Notebooks D100052 and D100008 describe this experiment and the conditions used for the various operations. The sample number for the above described composition was 13-1. The composition of sample 13-2 has been blanked out from the page, and the results for the thermal conductivity of this sample have been omitted.

10. This experiment was designed to mimic Example 4 of WO the Example in which the highest content of carbon (fiber) is present in the composition. Although the LCP used in Example 4 is different than that used in the present comparative example, it is my opinion that this makes no consequential difference in the results and the interpretation of those results. As mentioned in J.A. Heiser, et al., *Polym. Comp.*, vol. 25, p.186-193(2004), all polymers have essentially the same thermal conductivities. This is confirmed for LCPs in C.L. Choy, et al., *J. Polym. Sci., B: Polym Physics*, vol. 33, p. 2055-2064(1995) wherein two different LCPs which have differing types of repeat units have essentially the same thermal conductivity. That any difference is inconsequential to the results is confirmed in R.C. Progelhof et al., *Polym. Eng. Sci.*, vol. 16, p. 615-625(1976), where on p. 615 the only parameter of the continuous phase (polymer) needed to calculate the thermal conductivity of a composite is its thermal conductivity, k_c. Indeed since essentially all organic polymers have the same thermal conductivity, any polymer could have been used in the Comparative Example described above.

11. Insofar as the difference between a composition containing 8 weight percent carbon black and 10 weight percent carbon black (the maximum in WO) is concerned, it is my opinion that the very low value obtained with 8 weight shows that much more than 10 weight percent is needed to achieve a thermal conductivity of 0.7 W/mK. This is confirmed in J.A. King, et al., *J. Appl. Polym. Sci.*, vol. 99, p. 1552-1558(2006), J.M. Kieth, et al., *J. Appl. Polym. Sci.*, vol. 102, p. 5456-5462(2006), and J.M. Kieth, et al., *J. Appl. Polym. Sci.*, vol. 105, p. 3309-3316(2007), wherein LCP compositions filled with

various forms of carbon require *at least* about 35 weight percent of the carbon filler must be present to achieve a thermal conductivity of 0.7 W/mK or more.

12. As far as Nakamichi is concerned, calculations show that his compositions can contain about 1.8 to 33.2 weight percent (carbon) filler. It is my opinion that depending on the particular carbon filler chosen, the upper end of this range (say 28 weight percent or more) may produce compositions that have the requisite 0.7 W/mK or more thermal conductivity, but obviously from J.A. Heiser, et al., *Polym. Comp.*, vol. 25, p. 186-193(2004), J.A. King, et al., *J. Appl. Polym. Sci.*, vol. 99, p. 1552-1558(2006), J.M. Kieth, et al., *J. Appl. Polym. Sci.*, vol. 102, p. 5456-5462(2006), and J.M. Kieth, et al., *J. Appl. Polym. Sci.*, vol. 105, p. 3309-3316(2007) the form of carbon, that is the particle shape and size, and how the carbon was prepared, are important in determining exactly how much carbon will be required.

All statements made herein of my own knowledge are true, all statements made herein on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001, and may jeoparidize the validity of the application or any patent issuing thereon.

By Joel Citron
Joel Citron

Date: Jan 15, 2008